

## CLAIMS:

1. Recordable optical record carrier for recording information using a radiation beam having wavelength  $\lambda$  and incident on an entrance surface of the optical record carrier comprising, in this order:

- a protective layer facing the entrance surface,

5 - a first recording stack (L0), said recording stack comprising a recording layer of an organic dye material and a groove structure,

- a transparent spacer layer sandwiched between neighboring recording stacks,

and

- a second recording stack (LN) comprising a recording layer,

10 wherein the groove depth of the recording layer of the first recording stack (L0) is in a range from  $0.241 \cdot \lambda / n_s$  to  $0.362 \cdot \lambda / n_s$ , where  $n_s$  is a refractive index of a material in a land between grooves on the groove structure.

2. Record carrier according to claim 1, wherein the groove depth of the recording

15 layer of the first recording stack (L0) is in a range from  $0.289 \cdot \lambda / n_s$  to  $0.337 \cdot \lambda / n_s$ .

3. Record carrier according to claim 1, wherein the groove width of the recording layer of the first recording stack (L0) is in a range from  $0.198 \cdot \lambda / NA$  to  $0.397 \cdot \lambda / NA$ , in

particular in a range from  $0.289 \cdot \lambda / NA$  to  $0.347 \cdot \lambda / NA$ , where NA is a numerical aperture of

20 the radiation beam incident on the optical record carrier.

4. Record carrier according to claim 1, further comprising:

- at least one additional recording stack between the protective layer and the second recording stack (LN), said additional recording stack comprising a recording layer of  
25 an organic dye material and a groove structure and

- transparent spacer layers sandwiched between the neighboring recording stacks,

wherein the groove depth of the recording layer of at least one of said additional recording stacks is in a range from  $0.241 \cdot \lambda / n_s$  to  $0.362 \cdot \lambda / n_s$ .

5. Record carrier according to claim 4, wherein the groove depth of the recording layer of at least one of said additional recording stacks is in a range from  $0.289 \cdot \lambda / n_s$  to  $0.337 \cdot \lambda / n_s$ .

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6. Record carrier according to claim 4, wherein the groove width of the recording layers of at least one of said additional recording stacks is in a range from  $0.198 \cdot \lambda / NA$  to  $0.397 \cdot \lambda / NA$ , in particular in a range from  $0.289 \cdot \lambda / NA$  to  $0.347 \cdot \lambda / NA$ .

10 7. Record carrier according to claim 1 or 4, wherein each recording stack further comprises a metal reflective or heat-sink layer arranged on the side of the recording layer facing away from the entrance surface.

8. Record carrier according to claim 7, wherein said metal reflective or heat-sink layers are substantially made of a material of the group consisting Ag, Al, Au or Cu.

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9. Record carrier according to claim 7, wherein the thickness of said reflective or heat-sink layers is in a range below 40 nm, in particular below 25 nm.

20 10. Record carrier according to claim 1 or 4, wherein the thickness of the recording layer of at least one recording stack at a groove position is in a range from  $0.168 \cdot \lambda / n_r$  to  $0.336 \cdot \lambda / n_r$ , in particular in a range from  $0.235 \cdot \lambda / n_r$  to  $0.302 \cdot \lambda / n_r$ , where  $n_r$  is a refractive index of the recording layer.

25 11. Record carrier according to claim 1 or 4, wherein the recording layer of at least the first recording stack shows a leveling ratio in a range from 0.3 to 0.5, in particular in a range from 0.35 to 0.40, said leveling ratio being defined as the difference between the thickness of said recording layer at a groove position and the thickness of said recording layer at a land position normalized by the groove depth.